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(71) Applicant *(for all designated States except US)*: **BSN MEDICAL LTD.** [GB/GB]; Brierfield Mills, Brierfield, Nelson, Lancashire BB9 5NJ (GB).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **EVANS, John, Christopher** [GB/GB]; 14 Haugh Fold, Newhey, Lancashire OL16 3RF (GB). **CLAPHAM, Keith** [GB/GB]; 110 Hallam Road, Nelson, Lancashire BB9 8DJ (GB).

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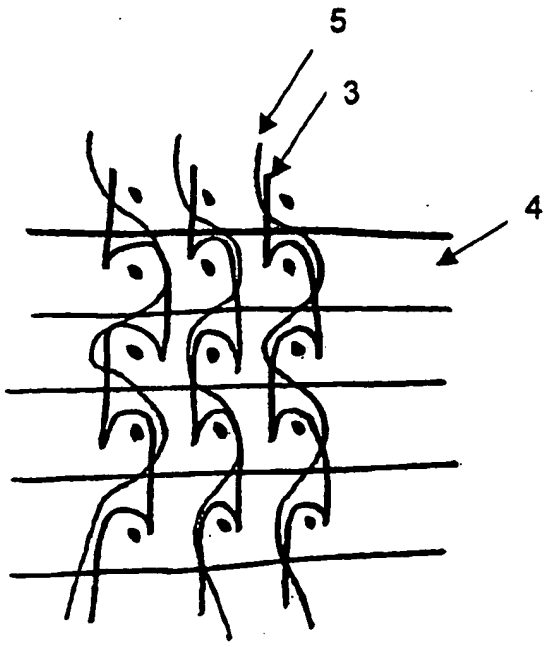

(57) **Abstract:** A bandage comprising a weft insertion fabric, in particular a light compression bandage which is a non-laminated and/or single layer bandage comprising a weft insertion fabric or a conformable bandage that essentially consists of a weft insertion fabric, and a method of treating venous leg, lymphodoema, muscle strain or muscle sprain, which comprises applying such a bandage.

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BANDAGE

The present invention relates to stretch fabrics and bandages, and in particular to light compression bandages.

Stretch fabrics are often used in the manufacture of bandages to provide bandages with the properties of light support and low compression. Such bandages are often used in the treatment of sprains, strains and venous leg ulcers. The bandages may also be used in sport applications where support is required on a body limb. These bandages should have sufficient elasticity, or stretch, to enable them to conform to the bandaged area and when secured, to allow limited movement and swelling to take place so that the circulation is not adversely affected.

Typical light compression bandages include elastic adhesive bandages (EAB), which traditionally comprise natural yarns, woven to form the fabric. Normally the yarns are woven using a plain weave design. In the manufacturing field of light compression bandages, the simplicity of woven fabrics is preferred over that of knitted fabrics. The woven fabrics of the prior art EABs offer extension in the warp, or length, direction only. Traditionally natural fibre materials were used as these materials were seen as superior to synthetic materials. Although synthetic and/or elastomeric yarns may offer greater initial stretch and superior fatigue resistance than natural yarns, such as cotton, natural yarns have been traditionally preferred for EABs. This is due to the aesthetic appearance of natural yarns and the perceived greater control stretch value, or controlled compression, of natural yarns than synthetic and/or elastomeric yarns.

However, regardless of what types of yarns are used to produce a stretch fabric, the loss of fatigue resistance over time still

remains a problem. In particular, the loss of fatigue resistance remains a problem to the previously known light compression bandages, e.g. EABs, which can suffer from loss of fatigue resistance within a few hours of application.

It is an object of the present invention to provide a light compression bandage, which addresses the problems of the prior art light compression bandages.

It is an object of the present invention to provide a light compression bandage, which offers greater conformability than the prior art light compression bandages.

It is a further object of the present invention to provide a light compression bandage, which has greater fatigue resistance than the prior art light compression bandages.

Accordingly, there is provided a bandage comprising a weft insertion fabric.

We also provide a non-laminated and/or single layer bandage comprising a weft insertion fabric.

Further, we provide a conformable bandage that essentially consists of a weft insertion fabric.

We further provide a conformable, non-laminated and/or single layer, bandage comprising a weft insertion fabric.

The term "weft insertion" is known in the art to mean a thread, yarn, filament or the like which is inserted in the weft direction and

held in place across the warp direction by pillar threads, yarns, filaments or the like.

We further provide the use of a bandage according to the invention in the treatment or alleviation of venous leg ulcers, lymphodoema, muscle strain or muscle sprain.

In particular we provide a use of a bandage according to the invention for the treatment of venous leg ulcers, lymphodoema, muscle strain or muscle sprain, which comprises applying a bandage according to the invention to an affected site on a patient.

Advantages of the present invention include the improved extension fatigue resistance of the bandage. This enables the bandages to have a longer working life thus saving time and costs as associated with the usage of traditional light compression bandages.

Another advantage of the present invention over the prior art is that the bandages of the present invention have improved conformability. This advantage may be best seen in the weft direction where the improved conformability over the prior art may be the greatest.

Previous light compression bandages, e.g. EABs, have had very little weft extension, if at all. Previously this was not seen as a problem, however surprisingly we have found that the present invention, by having some extension or stretch in the weft direction of the bandage increases conformability of the bandage. If the bandage has too much extension or stretch in the weft direction, as in a full knit fabric or bandage conformability is decreased not increased. Therefore, if a person skilled in the art wanted to

increase the stretch of the fabric of the bandage in the weft direction, they would be directed to produce a knit fabric, which may not necessarily increase conformability of the material.

The present invention therefore overcomes this prejudice in the art.

The present invention also makes it feasible to use other yarns besides natural yarns like cotton in the material for the bandage.

Any suitable yarn may be used in the invention although preferably the present invention will comprise a mixture of natural and synthetic yarns.

Typical staple fibre yarns suitable for use in the present invention include cellulosic fibre yarns such as cotton fibre or staple viscose rayon fibre yarns.

Suitable textured filaments for use in composite warp yarns or as textured yarns alone in bandages of the invention include textured filament yarns of synthetic fibre polymers such as polyamide or polyester.

Preferred textured filament yarns for use in the invention are textured filament yarns, e.g. nylon 6,6. Apt yarns of this type are known as 2/78 D.Tex nylon.

The composite yarns may comprise a cotton yarn and a textured polyamide yarn; suitably the composite yarn comprises a cotton yarn and a textured yarn twisted together.

Although any suitable yarn may be used, the pillar yarns may comprise synthetic, elastomer and/or natural fibres or filaments, or any combination thereof.

Suitable yarns may include cellulose yarns, e.g. cotton and generic products of cotton, and/or nylon.

Aptly the pillar yarns will contain synthetic and elastomeric fibres or filaments.

Preferably the weft yarns i.e. the weft insertions, will comprise natural yarns, this may include cellulose yarns. Apt yarns for the weft yarns of the present invention may comprise cotton and generic products of cotton.

Other typical yarns suitable as weft yarns of the present invention may comprise rayon or combinations of cotton and rayon.

Bandages according to the invention may comprise one or more inlay yarn for every one composite yarn.

The elastomeric yarn may comprise any natural or synthetic elastomers known per se. Natural elastomers include, for example, natural rubber.

Preferred synthetic elastomers include polyurethane elastomers. Such yarns may comprise 85% polyurethane. Thus, a polyurethane elastomeric yarn need not be 100% polyurethane.

Suitable polyurethane elastomeric yarns include those known as LYCRA (Trade Mark).

Other favoured polyurethane elastomeric yarns are ones, which have restricted stretching properties.

For example, preferred polyurethane elastomeric yarns are those, which are wrapped with a less elastic filament, i.e. a cotton or a synthetic wrapping.

The yarns used in the present invention, both for the pillar yarn and the weft insertion may be twisted to give further elastic properties to the yarn or to simply combine more than one yarn to form the composite yarn.

The twist level for the composite yarn can suitably be from 60 to 800 turns/meter, preferably less than 600 turns/meter and preferably more than 200 turns/metre.

Preferably, the bandage of the present invention will have an adhesive to aid holding of the bandage to the user. Clearly any adhesive used should be capable of adhering to that part of the body to which it is to be attached and to adjacent overlapping turns of the bandage.

Preferably the adhesive will be a pressure sensitive adhesive. By the term "pressure sensitive adhesive", it is intended to mean an adhesive, which is inherently tacky, visco-elastic and cohesive in its normal dry state.

The adhesive may be applied wholly or partly to one face of the bandage. However, preferably the adhesive layer should cover most of the area of one face of the bandage.

The adhesive, if used, may be a water permeable or water impermeable adhesive. Preferred water impermeable adhesives include natural rubber latex based adhesives, synthetic rubber based adhesives and hot-melt adhesives. Less preferred water impermeable adhesives include polyvinyl ethers and certain acrylate ester copolymers containing hydrophilic groups.

The light compression bandages of the present invention will now be illustrated, but by no way limited, by reference to the following drawings.

Figure 1 is a schematic view of the basic structure of a typical traditional woven bandage of the prior art.

Figure 2 is a schematic view of the basic structure of a light compression bandage of the present invention.

In Figure 1 the basic structure of a typical woven fabric bandage is shown, with warp yarns (1) and a weft yarns (2) that cross back and forth across the warp direction of the bandage, and down the warp direction of the bandage at each pick.

Figure 2 shows the basic structure of the bandage of the present invention with weft inserts (4) and pillar yarns comprising a first yarn (3) and a second yarn (5).

This embodiment of the present invention therefore shows loops in the warp direction but has a straight yarn in the weft direction. The weft ends do not loop but are free, like the cut ends of woven products. Fabric or bandages of this embodiment of the present invention may therefore resemble woven products in appearance.

The present invention will now be illustrated by the following examples.

Example 1

A light support compression bandage of the invention was formed from a fabric produced on a Paschel/Tricot high-performance warp-knitting machine suitable for weft insertion using a cotton/elastomeric composite yarn for the pillar yarns and a cotton/rayon yarn for the weft insertions.

The composite yarns used in this example for the pillar yarns were 19.68 Tex staple fibre cotton yarn and 1/78 D Tex elastomeric yarn respectively. The composite warp yarns contain the cotton and elastomeric yarns twisted together. The yarns used for the weft insertions were 19.68 Tex fibre cotton yarn and 29.8 Tex rayon yarn.

The bandage was 10 cm wide and comprised 71 ends/10cm for the pillar yarns. This bandage when applied to a limb at approximately 30% extension caused a compressive force on the limb of 30 mmHg.

CLAIMS

1. A bandage comprising a weft insertion fabric.

2. A bandage according to claim 1, which is a non-laminated bandage.

3. A bandage according to claim 1, which is a single layer bandage.

4. A bandage according to claim 1, which essentially consists of a weft insertion fabric.

5. A bandage according to claim 4, which is a non-laminated bandage.

6. A bandage according to claim 4, which is a single layer bandage.

7. A bandage according to claim 1, which comprise a mixture of natural and synthetic yarns.

8. A bandage according to claim 1, which comprises a weft insertion fabric which comprises staple cotton fibre yarns, staple viscose rayon fibre yarns, textured polyamide filament yarns, textured polyester filament yarns, textured polyamide filament composite warp yarns and/or textured polyester filament composite warp yarns.

9. A bandage according to claim 1, which comprises an adhesive layer which covers most of the area of one face of the bandage.

10. A method of treating venous leg ulcers, lymphodoema, muscle strain or muscle sprain, which comprises applying a bandage according to claim 1 to an affected site on a patient.

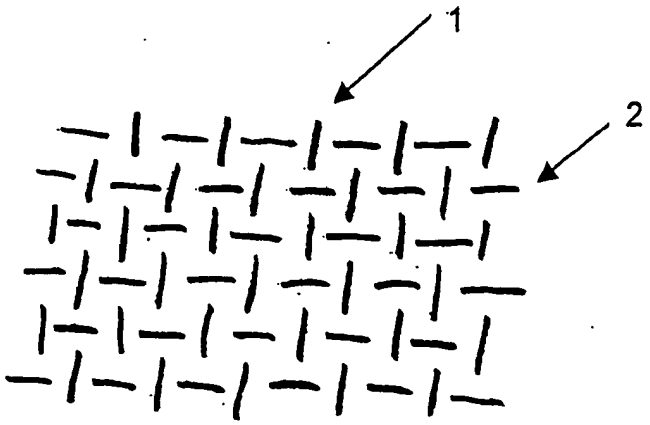

Figure 1

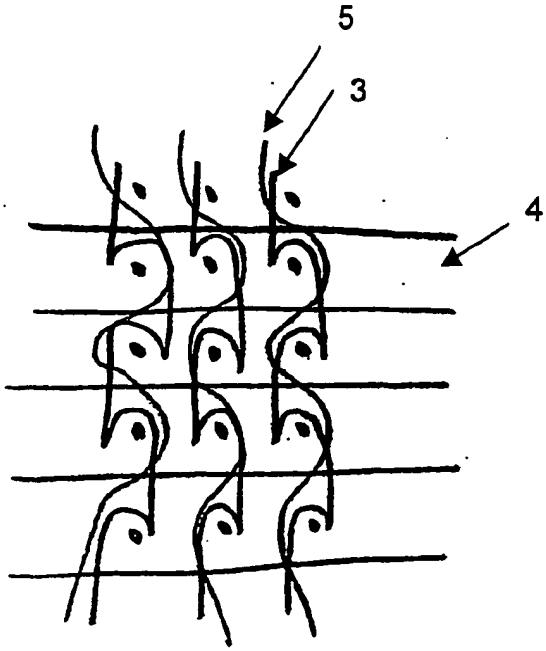

Figure 2